

STIC Search Report

EIC 1700

STIC Database Tracking Number: 112360

TO: Monique Wills
Location: REM 6C21
Art Unit : 1746
January 22, 2004

Case Serial Number: 09/888435

From: Michael Newell
Location: EIC 1700
REMSSEN 4A30
Phone: 571/272-2538
MNewell@uspto.gov

Search Notes

Reference #4 of 31 is the applicants' published patent application.

703-525-0978
MR. LEE & STENBA

SCIENTIFIC REFERENCE BR
Sci & Tech Info. Ctr.

SEARCH REQUEST FORM

Access DB# 112360

JAN 20

Scientific and Technical Information Center

Requester's Full Name: Pat & T.M. Office Monique Wills Examiner #: 75068 Date: 1/16/04
Art Unit: 1746 Phone Number 301-272-1308 Serial Number: 09/888,435
Mail Box and Bldg/Room Location: 6621 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: cathode active material/lithium battery employing the same

Inventors (please provide full names): Do-Young Seung, Won-chel Jung,
Chil-heon Do, Sung-in moon

Earliest Priority Filing Date: 6/26/01

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

PLEASE SEARCH for the
compound of claim 1 as an
active material.

SEE attached

IN THE CLAIMS:

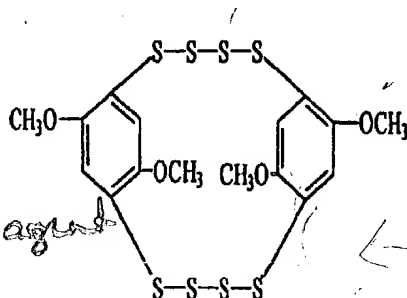
Please cancel claims 6-25.

7,37,10

1. (Original) A cathode active material comprising cyclic bis (2,5-bis-dithio-1,4-dimethoxybenzene) represented by formula 1; a conductive agent and a binder.

Original - merely
recites the purpose,
process or
intended use

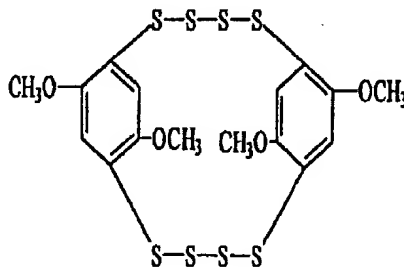
when adding conductive agent
& binder body
of claim
now recites
on preamble



Found
tire adhesives
all of the same
compound

The preamble is not
weighted unless it
provides structure for
something in the claim

2. (Original) A lithium battery comprising:
a cathode having a cathode active material layer comprising cyclic bis (2,5-bis-dithio-1,4-dimethoxybenzene) represented by formula 1, a conductive agent and a binder;



an anode having an anode layer comprising lithium metal or a lithium alloy; and
a separator interposed between the cathode and the anode.

3. (Original) The lithium battery according to claim 2, wherein the binder comprises at least one selected from the group consisting of polyethylene oxide (PEO), polyacrylonitrile (PAN), polymethyl methacrylate (PMMA), polyvinylidene fluoride (PVDF), acrylonitrile-methyl methacrylate-styrene terpolymer (AMS), vinylidene fluoride-hexafluoropropylene (VDF-HFP) copolymer, polyvinyl chloride (PVC) and cellulose.

4. (Original) The lithium battery according to claim 2, wherein the conductive agent comprises at least one selected from the group consisting of carbon black, acetylene black and vapor growth carbon fiber (VGCF).

5. (Original) The lithium battery according to claim 2, wherein the separator comprises at least one selected from the group consisting of polyethylene oxide (PEO), polyacrylonitrile (PAN), polymethyl methacrylate (PMMA), polyvinylidene fluoride (PVDF), acrylonitrile-methylmethacrylate-styrene terpolymer (AMS), vinylidene fluoride-hexafluoropropylene (PVDF-HFP) copolymer, polyvinyl chloride (PVC) and cellulose.

Claims 6-25. (Canceled)





STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact:*

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

➤ I am an examiner in Workgroup: Example: 1713

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



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STRUCTURE FILE UPDATES: 21 JAN 2004 HIGHEST RN 640234-51-1
DICTIONARY FILE UPDATES: 21 JAN 2004 HIGHEST RN 640234-51-1

TSCA INFORMATION NOW CURRENT THROUGH JULY 14, 2003

Please note that search-term pricing does apply when
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more
information enter HELP PROP at an arrow prompt in the file or refer
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(FILE 'HOME' ENTERED AT 15:00:42 ON 22 JAN 2004)

FILE 'LREGISTRY' ENTERED AT 15:00:54 ON 22 JAN 2004

L1 STRUCTURE
L2 STRUCTURE

FILE 'REGISTRY' ENTERED AT 15:08:34 ON 22 JAN 2004

L3 24 S L2 SSS SAM

FILE 'LREGISTRY' ENTERED AT 15:11:16 ON 22 JAN 2004

L4 STRUCTURE
L5 0 S L4 SSS SAM

FILE 'REGISTRY' ENTERED AT 15:22:42 ON 22 JAN 2004

L6 0 S L4 SSS SAM
L7 30 S L4 SSS FULL
SAVE L7 WIL435/A

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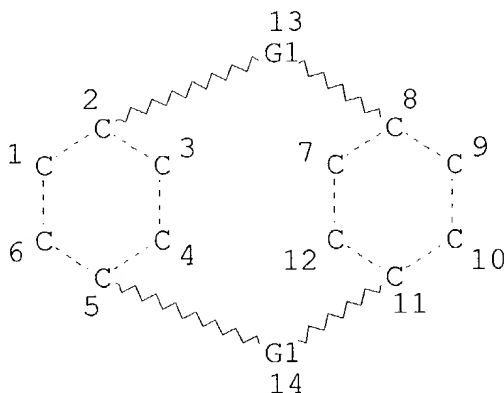
L8 0 S L7

FILE 'HCAPLUS' ENTERED AT 15:25:26 ON 22 JAN 2004

L9 31 S L7

FILE 'REGISTRY' ENTERED AT 15:30:20 ON 22 JAN 2004

=> d 17 que stat
L4 STR



REP G1=(1-6) S
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 14

STEREO ATTRIBUTES: NONE
L7 30 SEA FILE=REGISTRY SSS FUL L4

100.0% PROCESSED 87582 ITERATIONS
SEARCH TIME: 00.00.02

30 ANSWERS

=> file hcaplus
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FILE COVERS 1907 - 22 Jan 2004 VOL 140 ISS 4
FILE LAST UPDATED: 21 Jan 2004 (20040121/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d 19 1-31 cbib abs hitstr hitrn

L9 ANSWER 1 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:761342 Anthracene based organotrisulfide positive active materials for lithium secondary battery. Xue, L. J.; Li, J. X.; Hu, S. Q.; Zhang, M. X.; Zhou, Y. H.; Zhan, C. M. (College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, 430072, Peop. Rep. China). Electrochemistry Communications, 5(10), 903-906 (English) 2003. CODEN: ECCMF9. ISSN: 1388-2481. Publisher: Elsevier Science B.V..

AB From a facile prepn. method and available low-cost raw materials, the authors synthesized a novel kind of organo-trisulfide cathode material for lithium secondary batteries based on anthracene - anthra[1',9',8'-b,c,d,e][4',10',5'-b',c',d',e']bis-[1,6,6a(6a-SIV) trithial]pentalene (ABTH) and its homopolymer (PABTH), and studied the application of the organo-trisulfides to pos. active material for lithium secondary batteries. Two routes to ABTH were used, and polymers from both products were prepd. and tested. The organo-trisulfides were characterized by FTIR, XPS, and elemental anal. The cyclic voltammetry tests reveal that the redox reaction of the ABTHs was processed in two steps. The polymer has the specific capacity of 300 mAh/g at 2nd cycle and 250 mAh/g at the 5th cycle.

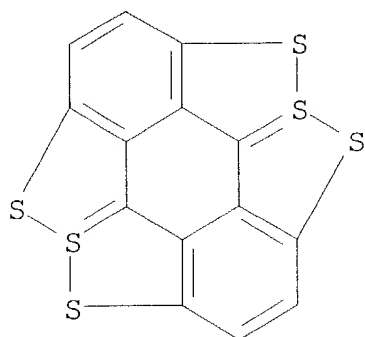
IT INDEXING IN PROGRESS

IT 68806-31-5P

(ABTH; anthracene based organo-trisulfide pos. active materials for lithium secondary battery)

RN 68806-31-5 HCAPLUS

CN 1,1a.lambd.4,2,5,5a.lambd.4,6-Hexathiacyclopenta[mno]pentaleno[2,1,6,5-fghi]aceanthrylene (9CI) (CA INDEX NAME)



IT 68806-31-5P

(ABTH; anthracene based organo-trisulfide pos. active materials for lithium secondary battery)

L9 ANSWER 2 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

2003:561945 Document No. 139:338279 Heteropolyacene with thianthrenium ring systems proving π -electron delocalization over S atoms. Oyaizu, Kenichi; Matsubara, Ryohei; Iwasaki, Tomokazu; Tsuchida, Eishun (Advanced Research Institute for Science and Engineering, Waseda University, Tokyo, Japan). Journal of Macromolecular Science, Pure and Applied Chemistry, A40(7), 655-670 (English) 2003. CODEN: JSPCE6. ISSN: 1060-1325. Publisher: Marcel Dekker, Inc..

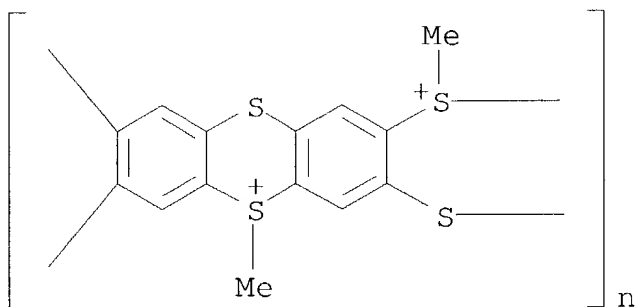
AB The superacid-induced condensation of o-methylsulfinylated thiophenyl(ene) compds. under dil. conditions induces an intramol. electrophilic ring-closing reaction of a hydroxysulfonium cation onto the adjacent benzene ring to yield the thianthrenium ring systems, which disclose π -electron delocalization over sulfonio linkages demonstrating the efficacy of planarization of the benzene rings for the p- π /d- π interaction in arylsulfonium moieties. Crystal structure of the thianthrenium salt reveals that the S⁺-C(phenyl) bond is significantly shortened upon the ring closing as a result of the increased bond order by the resonance effect.

IT 616237-70-8P

(formation via thianthrenium intramol. electrophilic ring-closing for synthesis of heteropolyacene)

RN 616237-70-8 HCAPLUS

CN Poly[(5-methylthianthrenium-2,3:7,8-tetrayl)-8-(methylsulfonio)-7-thio] (9CI) (CA INDEX NAME)



IT 616237-70-8P

(formation via thianthrenium intramol. electrophilic ring-closing for synthesis of heteropolyacene)

L9 ANSWER 3 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

2002:835614 Document No. 138:401624 Product class 7: 1,2-dithiolium salts and related compounds. Pedersen, C. Th. (Dep. Chem., Odense Universitet, Odense, Den.). Science of Synthesis, 11, 107-189 (English) 2002. CODEN: SSCYJ9. Publisher: Georg Thieme Verlag.

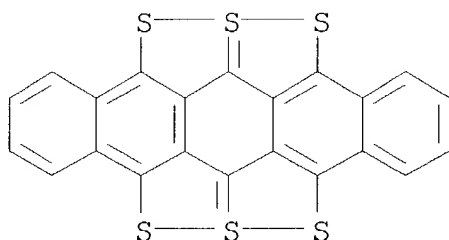
AB A review. Synthesis and reactions of simple and condensed 1,2-dithiolium compds. are reviewed. Reactions covered include condensations, heterocyclizations, oxidns., cyclizations, and substitution reactions.

IT 38037-63-7P

(prepn. of pentacene-fused trithiapentalene from pentacene and S8)

RN 38037-63-7 HCAPLUS

CN 1,6,6a.lambd.4,7,12,12a.lambd.4-Hexathiadipentaleno[2,1,6,5-fghi:2',1',6',5'-qrst]pentacene (9CI) (CA INDEX NAME)



IT 38037-63-7P

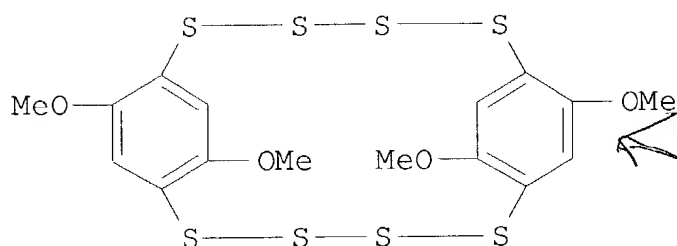
(prepn. of pentacene-fused trithiapentalene from pentacene and S8)

L9 ANSWER 4 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

2002:354007 Document No. 136:343388 Cathode active material for

lithium battery. Seung, Do-young; Jung, Won-chel; Do, Chil-hoon; Moon, Sung-in (S. Korea). U.S. Pat. Appl. Publ. US 20020055039 A1 20020509, 24 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-888435 20010626. PRIORITY: KR 2000-52208 20000904; KR 2001-32952 20010612.

GI



This is the applicant

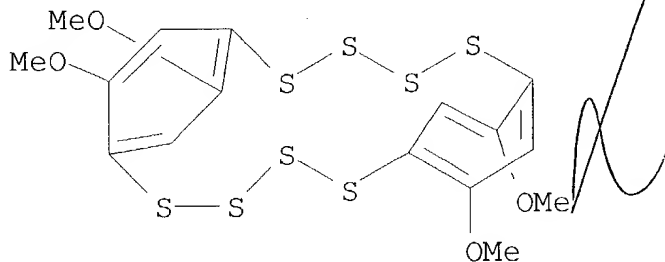
AB A cathode active material and a lithium secondary battery employing the same are provided. The cathode active material includes cyclic bis(2,5-bis-dithio-1,4-dimethoxybenzene) represented by formula (I), a conductive agent, and a binder. An anode layer comprises Li or a Li alloy.

IT **28321-69-9**

(cathode active material for lithium battery)

RN 28321-69-9 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,15,17,19-tetramethoxy- (9CI) (CA INDEX NAME)



IT **28321-69-9**

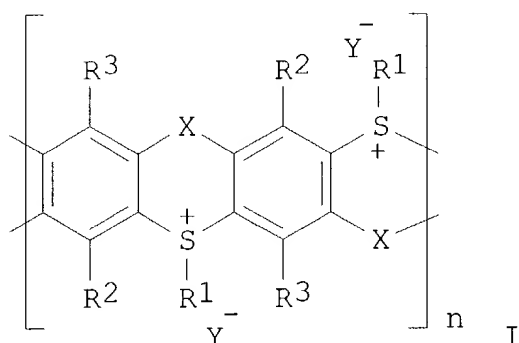
(cathode active material for lithium battery)

L9 ANSWER 5 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1999:713484 Document No. 131:323085 Polyheteroacenes having excellent

heat resistance, solvent solubility, and high electrical conductivity, and their manufacture. Tsuchida, Hidetoshi; Miyatake, Kenji; Ishikawa, Tadahiro; Tomitzuka, Noriyuki (Foundation for Scientific Technology Promotion, Japan). Jpn. Kokai Tokkyo Koho JP 11310636 A2 19991109 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-121501 19980430.

GI



AB Polyheteroacenes I [R1-R3 = H, halo, (hetero atom-contg.) alkyl, alkoxy, aryloxy; X = O, S, NH, N:, CH2; Y- = anion; n .gtoreq.2] are manufd. Thus, poly(oxy-2-methyl-6-methylsulfinyl-1,4-phenylene) was reacted with F3CSO3H at room temp. for 10 h to give I (R1, R3 = Me, R2 = H, X = O, Y = CF3SO3).

IT 249516-18-5P

(ladder polymer; manuf. of polyheteroacenes having good heat resistance, solvent soly. and high elec. cond.)

RN 249516-18-5 HCAPLUS

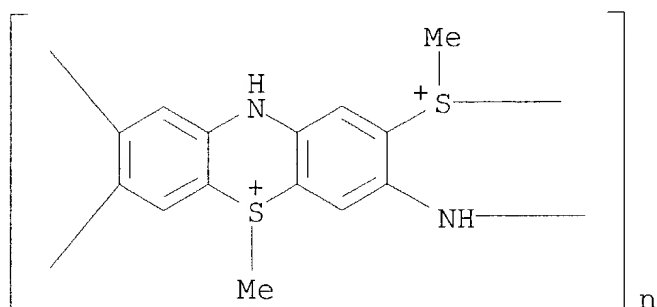
CN Poly[(5-methylphenothiazinium-2,3:7,8-tetrayl)-7-imino-8-(methylsulfoniumylidene) diperchlorate] (9CI) (CA INDEX NAME)

CM 1

CRN 249516-17-4

CMF (C14 H12 N2 S2)n

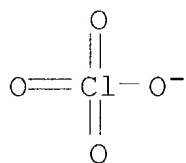
CCI PMS



CM 2

CRN 14797-73-0

CMF C1 O4



IT 249516-15-2P 249516-21-0P 249516-22-1P

(ladder polymer; manuf. of polyheteroacenes having good heat resistance, solvent soly. and high elec. cond.)

RN 249516-15-2 HCAPLUS

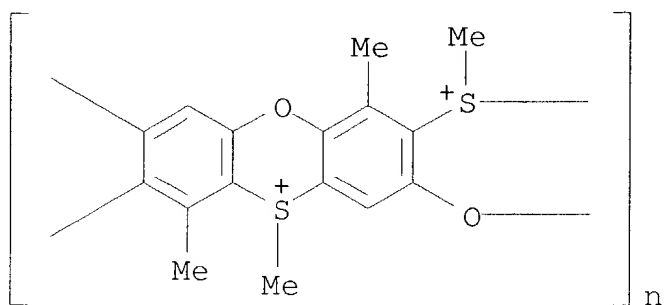
CN Poly[(1,6,10-trimethylphenoxathiinium-2,3:7,8-tetrayl)-7-(methylsulfoniumylidene)-8-oxy salt with trifluoromethanesulfonic acid (2:1)] (9CI) (CA INDEX NAME)

CM 1

CRN 249516-14-1

CMF (C16 H14 O2 S2)n

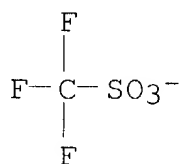
CCI PMS



CM 2

CRN 37181-39-8

CMF C F3 O3 S



RN 249516-21-0 HCAPLUS

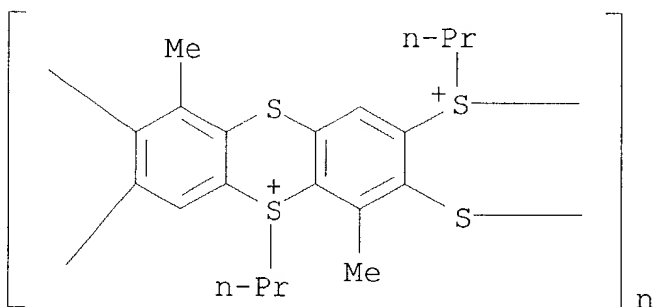
CN Poly[(1,6-dimethyl-5-propylthianthrenium-2,3:7,8-tetrayl)-8-(propylsulfoniumylidene)-7-thio salt with trifluoromethanesulfonic acid (2:1)] (9CI) (CA INDEX NAME)

CM 1

CRN 249516-20-9

CMF (C20 H22 S4)n

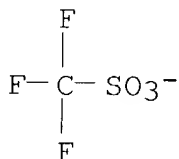
CCI PMS



CM 2

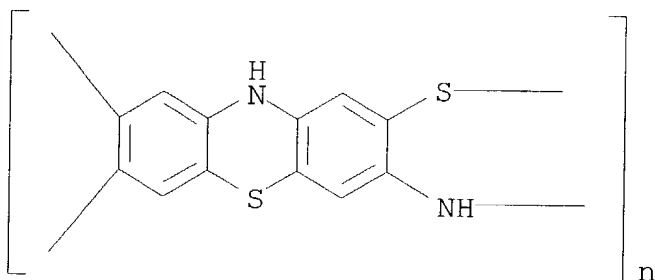
CRN 37181-39-8

CMF C F3 O3 S



RN 249516-22-1 HCAPLUS

CN Poly(10H-phenothiazine-2,3:7,8-tetrayl-7-imino-8-thio) (9CI) (CA INDEX NAME)



IT 249516-18-5P

(ladder polymer; manuf. of polyheteroacenes having good heat resistance, solvent soly. and high elec. cond.)

IT 249516-15-2P 249516-21-0P 249516-22-1P

(ladder polymer; manuf. of polyheteroacenes having good heat resistance, solvent soly. and high elec. cond.)

L9 ANSWER 6 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1999:178175 Document No. 130:281795 Reactions of potassium

N-(vinylxyethyl)dithiocarbamate with polyfluoroaromatic compounds. Amosova, S. V.; Gavrilova, G. M.; Gostevskaya, V. I.; Samoylova, A. A.; Toryashinova, D. -S. D. (Siberian Division, Russian Academy of Sciences, Irkutsk, Russia). Russian Journal of Organic Chemistry (Translation of Zhurnal Organicheskoi Khimii), 34(6), 867-869 (English) 1998. CODEN: RJOCEQ. ISSN: 1070-4280. Publisher: MAIK Nauka/Interperiodica Publishing.

AB The esters formed by the nucleophilic substitution of pentafluoropyridine, C₆F₆, C₆F₅Cl, 4-vinylthio-2,3,5,6-tetrafluoro-1-

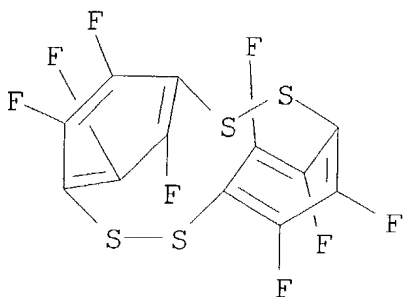
chlorobenzene, and 1,4-bis(vinylthio)-2,3,5,6-tetrafluorobenzene with potassium N-[(2-vinyloxy)ethyl]dithiocarbamate in DMF were unstable and the reaction yielded only 2-(vinyloxy)ethyl isothiocyanate, 1,3-oxazolidine-2-thione, and bis(2,3,5,6-tetrafluoro-p-phenylene-1,4-disulfide). The esters decomp. at 15-20.degree.C due to a strong inductive electron-withdrawing effect of the polyfluorinated benzene or pyridine ring.

IT 222961-37-7P

(reactions of potassium N-(vinyloxyethyl)dithiocarbamate with polyfluoroarom. compds.)

RN 222961-37-7 HCAPLUS

CN 2,3,8,9-Tetrathiatricyclo[8.2.2.24,7]hexadeca-4,6,10,12,13,15-hexaene, 5,6,11,12,13,14,15,16-octafluoro- (9CI) (CA INDEX NAME)



IT 222961-37-7P

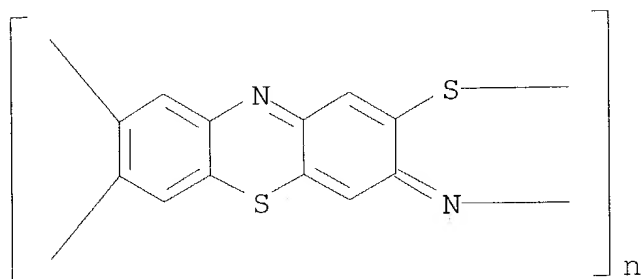
(reactions of potassium N-(vinyloxyethyl)dithiocarbamate with polyfluoroarom. compds.)

L9 ANSWER 7 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1991:43922 Document No. 114:43922 X-ray photoelectron spectroscopy studies of electrically conducting phenothiazine, phenoxazine and quinoxaline ladder polymers. Nalwa, H. S. (Dep. Mater. Syst. Eng., Tokyo Univ. Agric. Technol., Koganei, 184, Japan). Journal of Materials Science Letters, 9(11), 1296-9 (English) 1990. CODEN: JMSLD5. ISSN: 0261-8028.

AB The charge-transfer (CT) interactions in ladder-type polyphenothiazine (I), polyphenoxazine (II), and polyquinoxaline (III) and the nature of polymer-polyphosphoric acid (IV) interactions involved with the trend of elec. cond. of theses polymers were studied in accordance with XPS data. The elec. cond. followed ordering of I > II > III, depending on the extent of conjugation length, mol. wt., defects, etc. XPS results showed that CT interactions took place at the N sites of I and II whereas -NH group might be involved in III. The results also demonstrated that .pi.-electron conjugated backbone was oxidized by the presence of counterion IV which was involved with the obsd. trend f elec. cond.

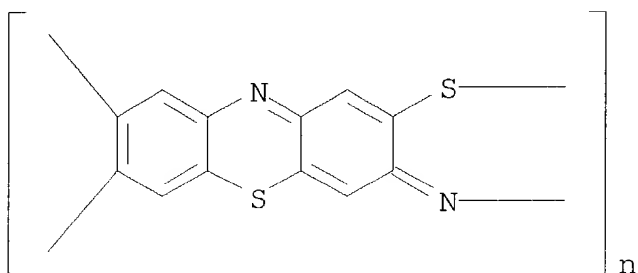
IT 95984-67-1
 (ladder-type, charge-transfer interactions in and elec. cond. of
 polyphosphoric acid-doped, XPS study of)
 RN 95984-67-1 HCAPLUS
 CN Poly(3H-phenothiazine-2,7,8-triyl-3-ylidene-3-nitrilo-2-thio) (9CI)
 (CA INDEX NAME)



IT 95984-67-1
 (ladder-type, charge-transfer interactions in and elec. cond. of
 polyphosphoric acid-doped, XPS study of)

L9 ANSWER 8 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
 1989:24580 Document No. 110:24580 Conducting properties and electron
 paramagnetic resonance of polyphenothiazine and polyphenoxazine
 ladder polymers. Pace, M. D.; Kim, Oh Kil (Nav. Res. Lab.,
 Washington, DC, 20375-5000, USA). Synthetic Metals, 25(4), 333-9
 (English) 1988. CODEN: SYMEDZ. ISSN: 0379-6779.
 AB The cond. of conjugated heterocyclic polymers with phenothiazine and
 phenoxazine ladder structures is measured and compared to the spin
 concns. studied using EPR. These polymers were doped with 2 typical
 p-type doping systems (I2 and AsF5) and protonic acid dopants (H2SO4
 and ClSO3H). Enhancement of the cond. by doping is only 3-4 orders
 of magnitude, regardless of the difference in the doping systems,
 being only slightly higher with protonic acid dopants. In all cases
 the EPR signal consists of a single sym. first-deriv. line-shape.
 EPR spectra were studied in order to det.: (a) the relative spin
 concns. of the samples at room temp. (300 K); (b) the temp.
 dependence of the EPR linewidths and spin susceptibilities from 300
 K to 450 K; and (c) the spin-lattice (T1) and spin-spin (T2)
 relaxation times of the undoped and doped polymers at liq. N temp.
 (77 K).

IT 95984-67-1
 (EPR of doped, elec. cond. in relation to)
 RN 95984-67-1 HCAPLUS
 CN Poly(3H-phenothiazine-2,7,8-triyl-3-ylidene-3-nitrilo-2-thio) (9CI)
 (CA INDEX NAME)



IT 95984-67-1

(EPR of doped, elec. cond. in relation to)

L9 ANSWER 9 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1988:187294 Document No. 108:187294 Hueckel theory applied to large linear and cyclic conjugated .pi.-systems. Part II. Lagerstedt, Ingvar; Wennerstroem, Olof (Dep. Org. Chem., Chalmers Univ. Technol., Goeteborg, S-412 96, Swed.). Synthetic Metals, 20(3), 269-80 (English) 1987. CODEN: SYMEDZ. ISSN: 0379-6779.

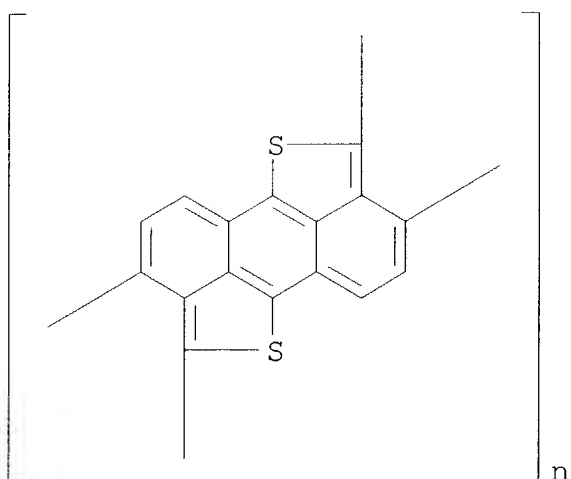
AB The band gap in ideal heteropolyarenes were calcd. by HMO theory. The previously described method, in which the actual calcns. are carried out on hypothetical ring compds. with Hueckel or Moebius topol. from the smallest repeating units of the polymer, was used. Nonplanar polymers are considered as well as the question of the repeating unit. Simple methods for the evaluation of .pi.-electron bandwidths are suggested. Band gaps were calcd. in polymers in which the repeating units are linked by more than one bond.

IT 114266-59-0

(band gap in, HMO calcn. of)

RN 114266-59-0 HCAPLUS

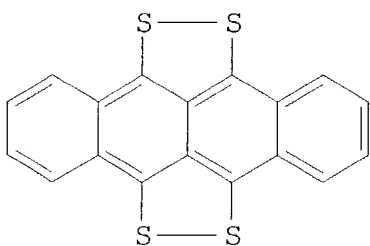
CN Poly(anthra[9,1-bc:10,5-b'c']dithien-2,3:7,8-tetrayl) (9CI) (CA INDEX NAME)



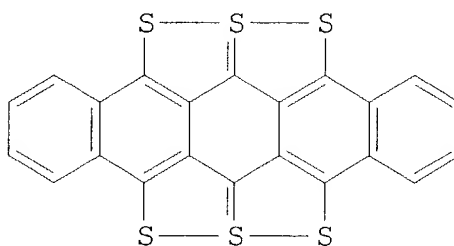
IT 114266-59-0
(band gap in, HMO calcn. of)

L9 ANSWER 10 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1988:130880 Document No. 108:130880 Energy structure of tetracene and
pentacene thio derivatives. Gorishnyi, M. P.; Kurik, M. V.; Libera,
L. (Inst. Fiz., Kiev, USSR). Ukrainskii Fizicheskii Zhurnal
(Russian Edition), 32(7), 1013-16 (Russian) 1987. CODEN: UFIZAW.
ISSN: 0503-1265.

GI



I



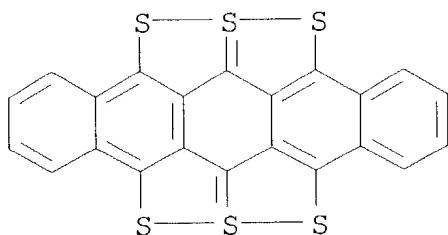
II

AB The long-wavelength bands in the electronic spectra of
tetrathiotetracene (I) and hexathiopentacene (II) correspond to
l-a.pi. transitions arising from the conjugation of sulfur 3pz
electrons with the .pi. system. Synthesized polythiopentacene is a
mixture of pentacene derivatives containing different numbers of S atoms.
Product purity depends on the method of synthesis.

IT 38037-63-7
(electronic spectrum of)

RN 38037-63-7 HCAPLUS

CN 1,6,6a.lambda.4,7,12,12a.lambda.4-Hexathiadipentaleno[2,1,6,5-fghi:2',1',6',5'-qrst]pentacene (9CI) (CA INDEX NAME)



IT 38037-63-7
(electronic spectrum of)

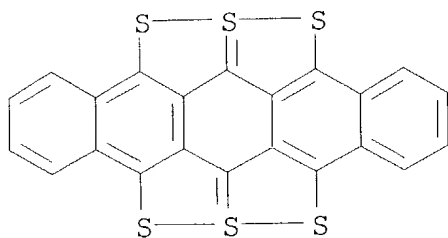
L9 ANSWER 11 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1987:165990 Document No. 106:165990 Structure and photochemical processes in thin film organic systems. Vertsimakha, Ya. I.; Grodzinskaya, M. D.; Libera, L.; Savchuk, A. V.; Sal'kova, E. N. (Tech. Hochsch. Karl-Marx-Stadt, Ger. Dem. Rep.). Potsdamer Forschungen der Paedagogischen Hochschule Karl Liebknecht Potsdam, Naturwissenschaftliche Reihe, 47, 5-7 (English) 1986. CODEN: PFBNDB. ISSN: 0138-2454.

AB The recording of stationary relief holograms in pentacene and hexathiopentacene film (thickness .apprx.1 .mu.m) was performed using a 2-beam scheme. The ruby laser radiation (0.69 .mu.m) was used with pulse duration of 40 ns and power of 1 MW. The intensity relation of the recording beams was 1:1. The readout was performed with He-Ne laser (0.63 .mu.m). Sensitivity of pentacene films was .apprx.1 J/cm²; diffraction efficiency .apprx.3%, for hexathiopentacene .apprx.0.1 J/cm² and .apprx.30%, resp. The mechanism of recording in the latter film was mainly evapn., while in pentacene it included evapn., thermoannealing, and photochem. reaction with formation of pentacene quinones.

IT 38037-63-7
(holog. recording in films of, mechanism and characteristics of)

RN 38037-63-7 HCAPLUS

CN 1,6,6a.lambda.4,7,12,12a.lambda.4-Hexathiadipentaleno[2,1,6,5-fghi:2',1',6',5'-qrst]pentacene (9CI) (CA INDEX NAME)



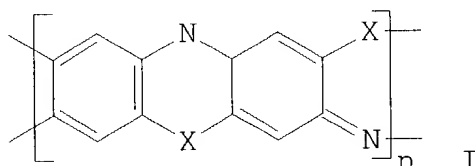
IT 38037-63-7

(holog. recording in films of, mechanism and characteristics of)

L9 ANSWER 12 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1986:554085 Document No. 105:154085 Conductive heterocyclic ladder polymers. Kim, Oh Kil (United States Dept. of the Navy, USA). U. S. Pat. Appl. US 739354 A0 19860103, 10 pp. Avail. NTIS Order No. PAT-APPL-6-759 354. (English). CODEN: XAXXAV. APPLICATION: US 1985-739354 19850530.

GI



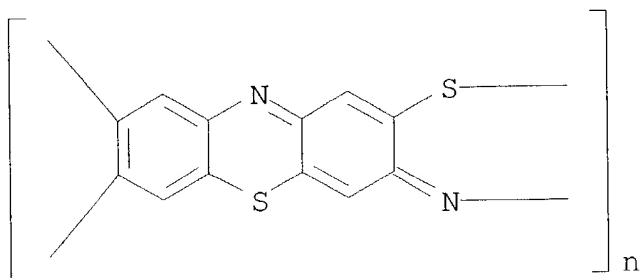
AB The title polymers I (X = O or S) or their chloro derivs. are prepd. by polycondensation of 2,5-diamino-1,4-benzenedithiol (II) and 2,5-dichloro p-benzoquinone (III) or 2,3,5,6-tetrachloro-p-benzoquinone or 2,5-dichloro-p-phenylenediamine and 2,5-dihydroxy p-benzoquinone or its chloro derivs. in polyphosphoric acid (IV) at 250.degree.. The polymers have good thermal and sulfuric acid or other polar solvent resistance, are useful in lightwt. batteries for elec. vehicles and for metallic conductors for air craft. Thus, a mixt. of IV 60, II.2HCl 1.22 and III 0.866g was heated 21 h at 250.degree. to give 1.5 g I (X = S). The polymer was doped by ClSO₃H giving a cond. 2.1 .times. 10⁻² mho/cm.

IT 95984-67-1

(elec. conductive, manuf. of heat-resistant)

RN 95984-67-1 HCAPLUS

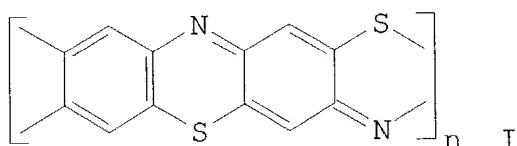
CN Poly(3H-phenothiazine-2,7,8-triyl-3-ylidene-3-nitrilo-2-thio) (9CI)
(CA INDEX NAME)



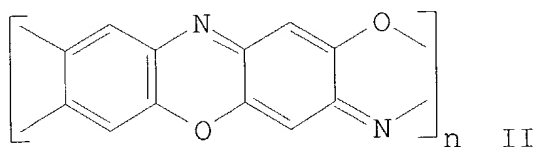
IT **95984-67-1**
(elec. conductive, manuf. of heat-resistant)

L9 ANSWER 13 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1985:167501 Document No. 102:167501 Electrical conductivity of
heteroaromatic ladder polymers. 3. Phenothiazine and the
structurally related ladder polymers. Kim, Oh Kil (Chem. Div., Nav.
Res. Lab., Washington, DC, 20375, USA). Journal of Polymer Science,
Polymer Letters Edition, 23(3), 137-9 (English) 1985. CODEN:
JPYBAN. ISSN: 0360-6384.

GI



I



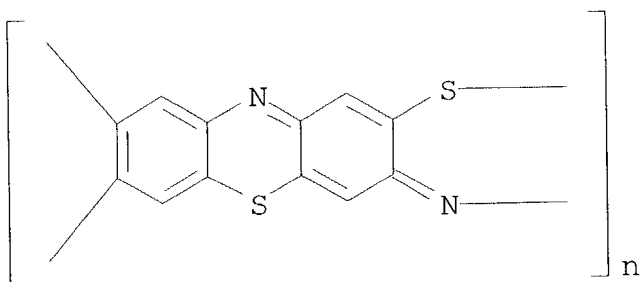
II

AB Phenothiazine and phenoxazine ladder polymers having the structures
I [95984-67-1] and II [90961-00-5], resp., were prepd.
by polycondensation of 2,5-diamino-1,4-benzenethiol with
2,5-dichloro-p-benzoquinone or 2,5-dichloro-p-phenylenediamine with
2,5-dihydroxy-p-benzoquinone in polyphosphoric acid at 250.degree..
The black, insol. polymers were amorphous and had room temp. cond.
10⁻⁵-10⁻⁶ and 1 .times. 10⁻⁸ .OMEGA.-1 cm⁻¹ (I and II, resp.). The
polymers are potential candidates for cathode materials in
high-energy-d. batteries.

IT **95984-67-1P**
(ladder, prepn. and elec. cond. of)

RN 95984-67-1 HCAPLUS

CN Poly(3H-phenothiazine-2,7,8-triyl-3-ylidene-3-nitrilo-2-thio) (9CI)
(CA INDEX NAME)



IT 95984-67-1P
(ladder, prepn. and elec. cond. of)

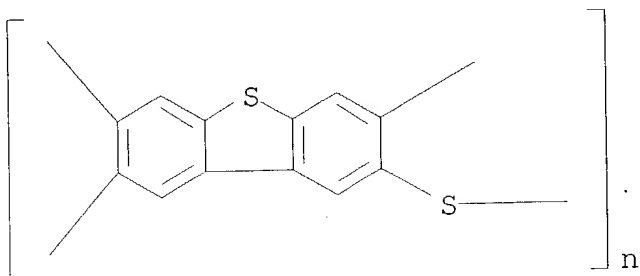
L9 ANSWER 14 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1983:423256 Document No. 99:23256 Electronic properties of
sulfur-containing conjugated polymers. Bredas, J. L.; Elsenbaumer,
R. L.; Chance, R. R.; Silbey, R. (Lab. Chim. Theor. Appl., Fac.
Univ. Notre-Dame de la Paix, Namur, B-5000, Belg.). Journal of
Chemical Physics, 78(9), 5656-62 (English) 1983. CODEN: JCPSA6.
ISSN: 0021-9606.

AB Valence-effective Hamiltonian (VEH) calcns. were performed on 7
S-contg. org. conjugated polymers of interest to the conducting
polymer field, and the theor. results for parameters related to
cond., such as ionization potentials, bandwidths, and bandgaps were
presented. The electronic structure description afforded by the VEH
method for the S-contg. polymers was demonstrated to be of the same
quality as that presented previously for hydrocarbon polymers. In
particular, for ionization potentials, good agreement with available
exptl. data on poly(p-phenylene sulfide) (I) [25212-74-2] and
polybenzothiophene (II) [83847-63-6] was obtained, after
scaling downward the VEH values by a 1.9-eV polarization correction.
Comparison between the theor. and previously reported exptl. XPS
spectra for II was excellent with use of the same energy scaling
factor previously employed for polyacetylene, poly(p-phenylene), and
I.

IT 83847-63-6
(electronic properties of, calcn. of)

RN 83847-63-6 HCAPLUS

CN Poly(2,3:7,8-dibenzothiophenetetrayl-8-thio) (9CI) (CA INDEX NAME)



IT 83847-63-6
(electronic properties of, calcn. of)

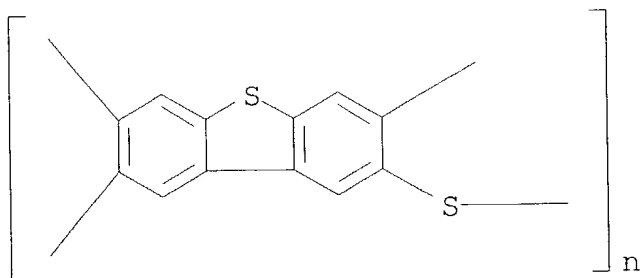
L9 ANSWER 15 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1982:628247 Document No. 97:228247 Highly conductive meta derivatives of poly(phenylene sulfide). Elsenbaumer, R. L.; Shacklette, L. W. (Polymer Lab., Allied Corp., Morristown, NJ, 07960, USA). Journal of Polymer Science, Polymer Physics Edition, 20(10), 1781-7 (English) 1982. CODEN: JPLPAY. ISSN: 0098-1273.

AB Changes in the backbone structure of several meta derivs. of polyphenylenesulfide upon doping with AsF₅ were investigated by IR spectroscopy. Poly(m-phenylene sulfide) does not form a conducting complex with AsF₅ unless reacted under conditions where C-C bonds form intramolecularly between Ph rings. This assertion was verified by comparison of the IR spectra of poly(m-phenylene sulfide) and a newly synthesized deriv., poly(thio-3,7-dibenzothiophendiyl), after doping with AsF₅. This new deriv. forms a complex with AsF₅ which exhibits a cond. of 18.5 S/cm. A sulfone-contg. deriv. was also synthesized, poly[thio-3,7-(dibenzothiophene-5,5-dioxide)-diyl]. With this polymer, a much lower cond., 10⁻³ S/cm, was obtained after exposure to AsF₅.

IT 83847-63-6
(elec. cond. of, doped with arsenic pentafluoride)

RN 83847-63-6 HCAPLUS

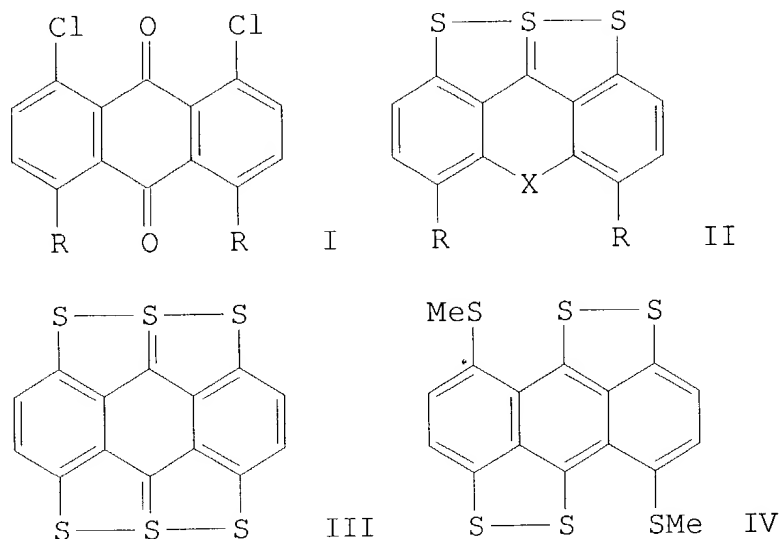
CN Poly(2,3:7,8-dibenzothiophenetetrayl-8-thio) (9CI) (CA INDEX NAME)



IT 83847-63-6
(elec. cond. of, doped with arsenic pentafluoride)

L9 ANSWER 16 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1980:639288 Document No. 93:239288 The dithiole series. Part 7.
Synthesis of compounds containing condensed ring systems related to
1,6,6a.lambda.4-trithiapentalene. Davidson, Stephen; Grinter,
Trevor J.; Leaver, Derek; Steven, James H. (Dep. Chem., Univ.
Edinburgh, Edinburgh, EH9 3JJ, UK). Journal of Chemical Research,
Synopsis (7), 221 (English) 1980. CODEN: JRPSDC. ISSN: 0308-2342.
OTHER SOURCES: CASREACT 93:239288.

GI



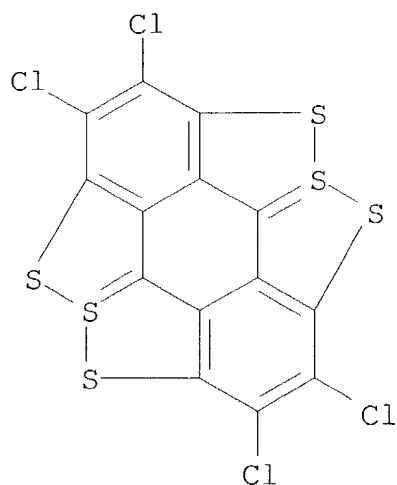
AB Reaction of the chloroanthraquinones I (R = H, NO₂), with Na₂S in
aq. DMF (reflux, 2 and 5 h, resp.) gave the
trithiapentalenoanthracene derivs. II [X = C(:O); R = H, NH₂], resp.
Similar reaction of I (R = Cl) (reflux, 8 h) gave the
hexathiadipentalenoanthracene III, which was converted to
1,4,5,8-tetra(methylthio)anthracene, and the anthrabisdithiole IV.
2,2',6,6'-Tetrachlorobenzophenone reacted with Na₂S (Me₂NCHO) to
give the purple tetrathiapentalenoanthracene II (X = S, R = H).

IT 68806-26-8P

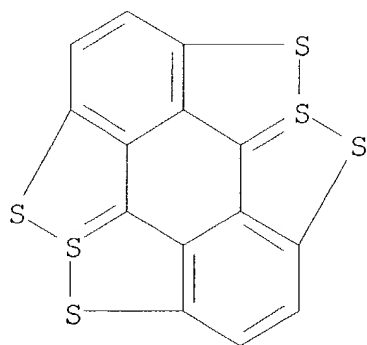
(prepn. of)

RN 68806-26-8 HCAPLUS

CN 1,1a.lambda.4,2,5,5a.lambda.4,6-Hexathiacyclopenta[mno]pentaleno[2,1
,6,5-fghi]aceanthrylene, 3,4,7,8-tetrachloro- (9Cl) (CA INDEX NAME)



IT 68806-31-5P
 (prepn., methylation, and redn. of)
 RN 68806-31-5 HCAPLUS
 CN 1,1a,4,2,5,5a,6-hexathiacyclopenta[mno]pentaleno[2,1,6,5-fghi]aceanthrylene (9CI) (CA INDEX NAME)

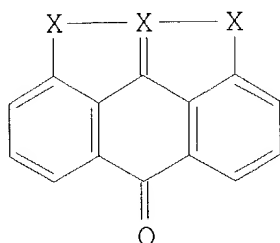


IT 68806-26-8P
 (prepn. of)
 IT 68806-31-5P
 (prepn., methylation, and redn. of)

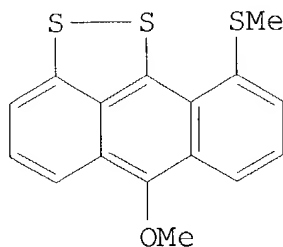
L9 ANSWER 17 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
 1979:73284 Document No. 90:73284 Heterocyclic quinonoid chromophoric systems: Part I. Thiathiophthenes and analogs as dyes. Ayyangar, N. R.; Purao, S. R.; Tilak, B. D. (Natl. Chem. Lab., Poona, India). Indian Journal of Chemistry, Section B: Organic Chemistry Including Medicinal Chemistry, 16B(8), 673-7 (English) 1978. CODEN: IJSBDB.

ISSN: 0376-4699. OTHER SOURCES: CASREACT 90:73284.

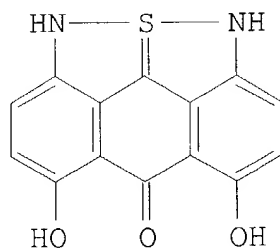
GI



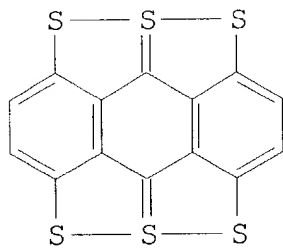
II



IV



V



VI

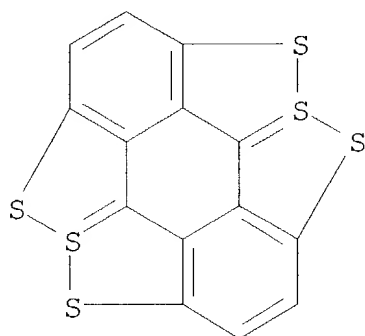
AB Reaction of 1,8-dichloroanthraquinone (I) [82-43-9] with Na₂S in DMF gave an intense compd. identified as II (X = S) (III) [68806-27-9]. Reductive methylation of III gave IV [68806-28-0]. Similarly, I and CdSe gave red II (X = Se) [68806-29-1], and 4,5-dihydroxy-1,8-dinitroanthraquinone [81-55-0] and Na₂S gave violet-blue V [68806-30-4]. These compds. can be used as disperse dyes for polyester fibers, but their lightfastness is poor. Reaction of 1,4,5,8-tetrachloroanthraquinone [81-58-3] with Na₂S in DMF gave a compd. identical in dyeing properties and IR spectra to C.I. Vat Green 7 [1328-12-7] and assigned the structure VI [68806-31-5].

IT 68806-31-5P

(prepn. and dyeing properties of)

RN 68806-31-5 HCAPLUS

CN 1,1a.lamda.4,2,5,5a.lamda.4,6-Hexathiacyclopenta[mno]pentaleno[2,1,6,5-fghi]aceanthrylene (9CI) (CA INDEX NAME)

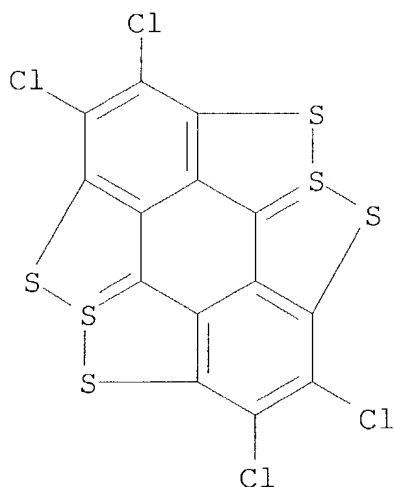


IT 68806-26-8P 68806-31-5DP, reductive methylation products

(prepn. of)

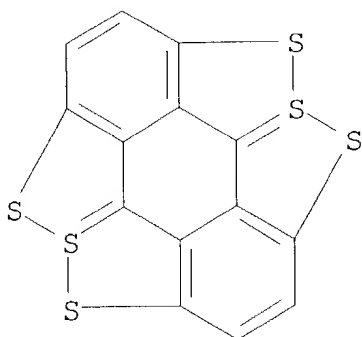
RN 68806-26-8 HCAPLUS

CN 1,1a.lambda.4,2,5,5a.lambda.4,6-Hexathiacyclopenta[mno]pentaleno[2,1,6,5-fghi]aceanthrylene, 3,4,7,8-tetrachloro- (9CI) (CA INDEX NAME)



RN 68806-31-5 HCAPLUS

CN 1,1a.lambda.4,2,5,5a.lambda.4,6-Hexathiacyclopenta[mno]pentaleno[2,1,6,5-fghi]aceanthrylene (9CI) (CA INDEX NAME)



IT 68806-31-5P

(prepn. and dyeing properties of)

IT 68806-26-8P 68806-31-5DP, reductive methylation products

(prepn. of)

L9 ANSWER 18 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1976:46913 Document No. 84:46913 Comparative evaluation of the antioxidant properties of additives to synthetic lubricating oils. Sarnavskaya, T. I.; Lebedev, E. V.; Gordash, Yu. T.; Shablii, V. I. (Vses. Nauchno-Issled. Inst. Proektn. Kompleksn. Neftekhim. Protseessov, Leningrad, USSR). Khimiya i Tekhnologiya Topliv i Masel (9), 54-5 (Russian) 1975. CODEN: KTPMAG. ISSN: 0023-1169.

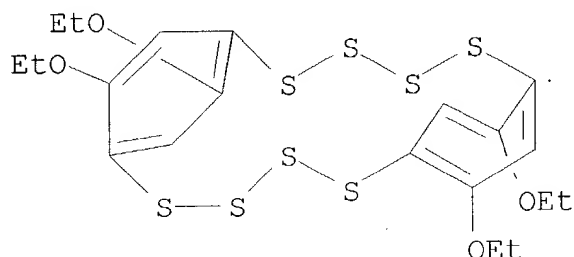
AB The effects of antioxidants contg. both S and N were detd. by isothermal thermogravimetry and ir spectroscopy. The oxidn. of such high-boiling synthetic ester oils as pentaerythritol tetrakis(.alpha.,.alpha.-dimethylcaprylate) [57916-02-6] and dioctyl sebacate [2432-87-3] was inhibited by antioxidants such as 3-phenyl-5-ethyl-4-thiono-2-thiazolidone [54103-66-1] and tetraethoxyoctathiodiphenyl [23557-12-2]. The optimal additive concn. depended on the type of synthetic oil.

IT 23557-12-2

(antioxidants for ester lube oils)

RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA INDEX NAME)



IT 23557-12-2
(antioxidants for ester lube oils)

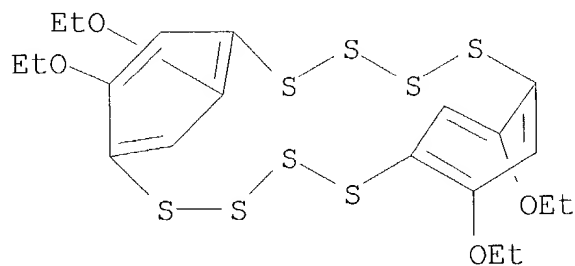
L9 ANSWER 19 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1975:566628 Document No. 83:166628 New methods to evaluate the
resistance of synthetic oils to thermal oxidative destruction.
Sarnavskaya, T. I.; Lebedev, E. V. (USSR). Khimiya i Tekhnologiya
Topliv i Masel (5), 61-2 (Russian) 1975. CODEN: KTPMAG. ISSN:
0023-1169.

AB DTA and thermogravimetric anal. were evaluated with the evaluation
criteria being the temp. of outbreak of the exothermal effect of
oxidn. and the wt. loss. The oxidn. velocities of synthetic ester
oils and of their compns. with additives were quant. detd. by the
change in optical d. The optical d. of compns. contg. 1%
tetraethoxyoctathiodiphenyl (I) [23557-12-2] increased
insignificantly after 6-9 hr heating, whereas without I, the
increase was continuous. The use of DTA made possible the rapid
detn. of the antioxidative effect of additives. The initial oxidn.
temp. was increased from 260 to 310.degree. by the addn. of 1% I.

IT 23557-12-2
(antioxidants, for ester lube oils)

RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA
INDEX NAME)



IT 23557-12-2
(antioxidants, for ester lube oils)

L9 ANSWER 20 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1974:413823 Document No. 81:13823 Polymerization of cyclic bis(arylene tetrasulfides). Hiatt, Norman A. (Uniroyal Chem. Div., Uniroyal, Inc., Naugatuck, CT, USA). Advances in Chemistry Series, No. 129, 92-104 (English) 1973. CODEN: ADCSAJ. ISSN: 0065-2393.

AB Cyclic bis(arylene tetrasulfides) (I, R1, R2 = OEt, OMe, Cl) were thermally polymd. to give polymers, with max. no. av. mol. wt. 15-16,000, which were stable at room temp. and were used as tire-cord and metal-to-metal adhesives. The ESR spectral data indicated a free radical polymn. mechanism analogous to that of S. The low mol. wt. of I polymers was attributed to the cleavage of free S from the main chain which degraded the polymer. The polymer with the S atoms directly attached to the arom. ring showed a higher glass transition temp. than the corresponding poly(phenylene sulfides). The polymer model constructed on the assumption of the change in proximity of S and O atoms from that in the cyclic monomer was confirmed by the shift of the uv absorption max. to lower wavelengths. Poly[tetrathio(2,5-diethoxy-p-phenylene)] [50940-34-6] obtained from I (R1 = R2 = OEt) had in a tire-cord adhesion test a tensile strength 2190 and 200 psi, elongation 390 and 250% after 15 and 30 min of curing, resp. In metal-to-metal adhesion it had a shear strength 155-198 psi.

IT ~~40838-82-2P~~ 50886-98-1P 50886-99-2P
(prepn. of, mechanism of thermal)

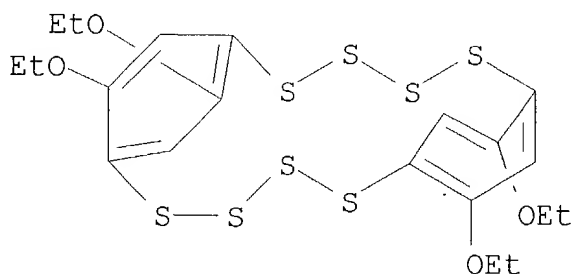
RN 40838-82-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy-, homopolymer (9CI)
(CA INDEX NAME)

CM 1

CRN 23557-12-2

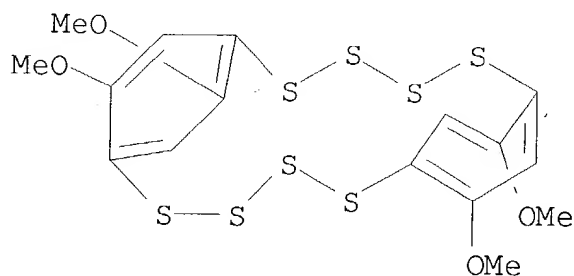
CMF C20 H24 O4 S8



RN 50886-98-1 HCAPLUS
 CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
 6,8,14,16,17,19-hexaene, 7,15,17,19-tetramethoxy-, homopolymer (9CI)
 (CA INDEX NAME)

CM 1

CRN 28321-69-9
 CMF C16 H16 O4 S8

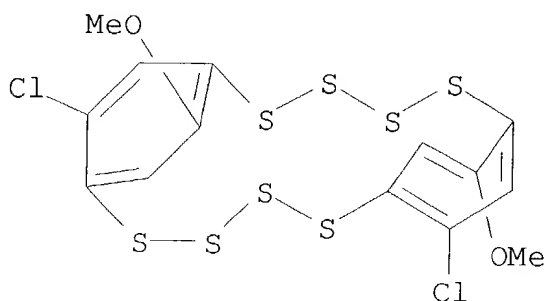


This is it!
MD

RN 50886-99-2 HCAPLUS
 CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
 6,8,14,16,17,19-hexaene, 7,16-dichloro-18,19-dimethoxy-, homopolymer
 (9CI) (CA INDEX NAME)

CM 1

CRN 40742-94-7
 CMF C14 H10 Cl2 O2 S8



IT 40838-82-2P 50886-98-1P 50886-99-2P
 (prepn. of, mechanism of thermal)

L9 ANSWER 21 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
 1974:36877 Document No. 80:36877 Dialkoxy phenylene bis-sulfonamides.

Ariyan, Zaven S.; Martin, Robert L. (~~Uniroyal, Inc.~~). U.S. US 3769342 19731030, 6 pp. Division of U.S. 3,621,032. (English).
 CODEN: USXXAM. APPLICATION: US 1971-122157 19710308.

GI For diagram(s), see printed CA Issue.

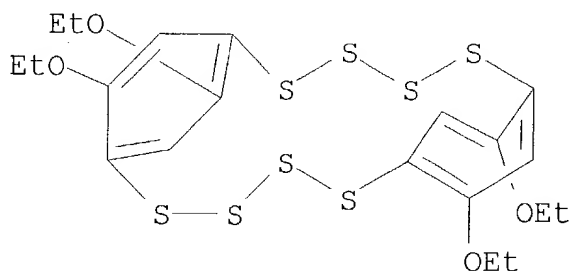
AB ROC6H4R1 reacted with S2Cl2 to give the cyclic polysulfides (I; R = Me, Et, PhCH2; R1 = OMe, OEt, Cl, PhCH2O). Catalytic hydrogenation of I gave the dithiols (II), useful as herbicides. Anhyd. chlorination of I gave the sulfenyl chlorides (III), but chlorination in the presence of H2O gave the sulfonyl chlorides (IV), which reacted with amines to give sulfonamides, useful as herbicides. II reacted with alkyl sulfonates or alkyl halides to give alkylthio derivs.

IT 23557-12-2P 28321-69-9P 30079-11-9P
 30235-77-9P

(prepn. of)

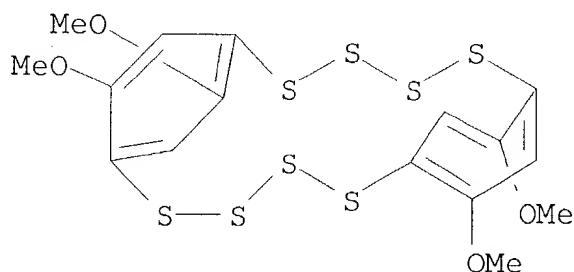
RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
 6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA
 INDEX NAME)



RN 28321-69-9 HCAPLUS

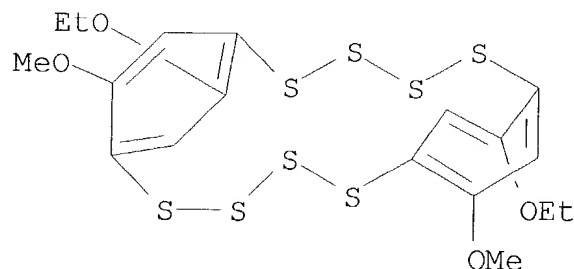
CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
 6,8,14,16,17,19-hexaene, 7,15,17,19-tetramethoxy- (9CI) (CA INDEX
 NAME)



This is it!

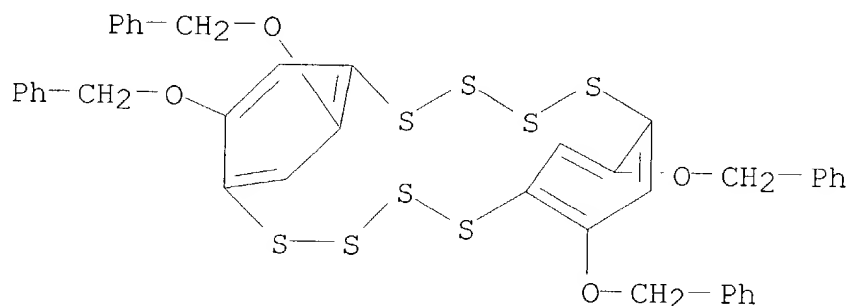
RN 30079-11-9 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,17-diethoxy-15,19-dimethoxy- (9CI) (CA
INDEX NAME)



RN 30235-77-9 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetrakis(phenylmethoxy)- (9CI)
(CA INDEX NAME)



IT 23557-12-2P 28321-69-9P 30079-11-9P
30235-77-9P
(prepn. of)

L9 ANSWER 22 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1974:28161 Document No. 80:28161 Polymerization of cyclic bis(arylene tetrasulfides). Hiatt, Norman A. (Uniroyal Chem. Div., Uniroyal, Inc., Naugatuck, CT, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 13(1), 594-6 (English) 1972. CODEN: ACPAY. ISSN: 0032-3934.

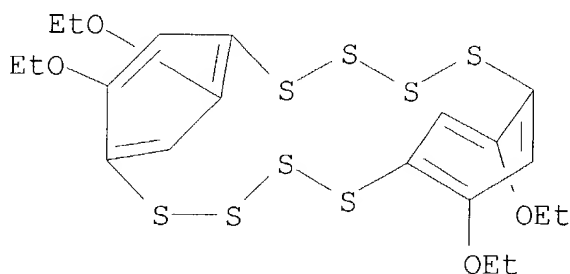
AB Cyclic bis(arylene tetrasulfides) (I), where R = OEt or OMe and R1 = OEt, OMe, or Cl, were thermal polymd. to give polyarylene sulfides useful as adhesives for metals and tire cords. Thus, 5 g I (R = R1 = OEt) was heated for 1 hr at 195.deg. to give 4.8 g of 7,15,17,19-tetraethoxy-2,3,4,5,10,11,12,13-octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene polymer

(II) [40838-82-2] of mol. wt. 15,781 which softened at 90.deg.. A metal cord-rubber composite with II adhesive was cured 15 min giving a product with adhesion 69% at 250.deg.F.

IT 40838-82-2 50886-98-1 50886-99-2
(adhesives, for metals and for tire cords)
RN 40838-82-2 HCAPLUS
CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy-, homopolymer (9CI)
(CA INDEX NAME)

CM 1

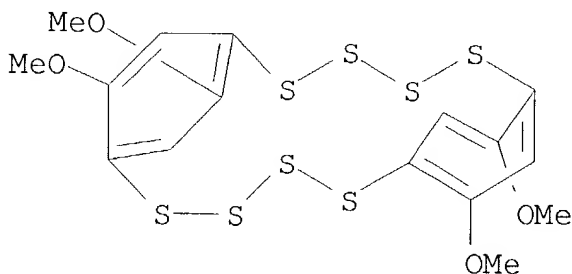
CRN 23557-12-2
CMF C20 H24 O4 S8



RN 50886-98-1 HCAPLUS
CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetramethoxy-, homopolymer (9CI)
(CA INDEX NAME)

CM 1

CRN 28321-69-9
CMF C16 H16 O4 S8



Thesis

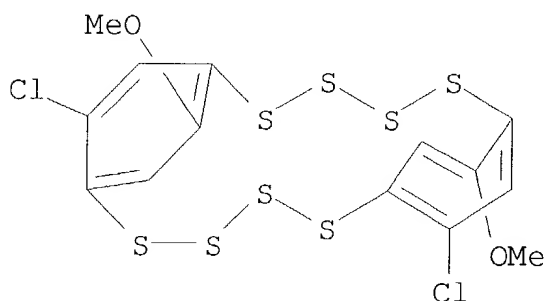
RN 50886-99-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,16-dichloro-18,19-dimethoxy-, homopolymer
(9CI) (CA INDEX NAME)

CM 1

CRN 40742-94-7

CMF C14 H10 Cl2 O2 S8



IT 40838-82-2 50886-98-1 50886-99-2
(adhesives, for metals and for tire cords)

L9 ANSWER 23 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1973:159696 Document No. 78:159696 Chalcogenated polyacenes.
Perez-Alberne, Evelio A. (Eastman Kodak Co.). U.S. US 3723417
19730327, 4 pp. (English). CODEN: USXXAM. APPLICATION: US
1971-149056 19710601.

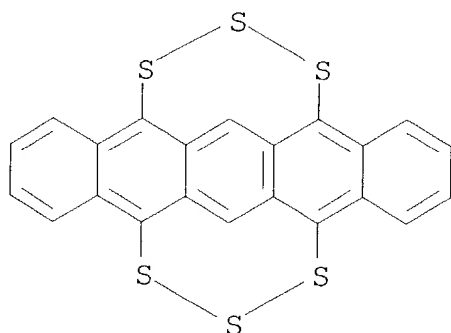
GI For diagram(s), see printed CA Issue.

AB Tetracene was treated with S in DMF to give 94.8% tetrathiotetracene
I. Pentacene and S similarly gave the hexathiopentacene II.
Tetraselenotetracene III was prepd. from tetracene and Se.

IT 41648-50-4P
(prepn. of)

RN 41648-50-4 HCAPLUS

CN 5,7:12,14-Diepitritiopentacene (9CI) (CA INDEX NAME)



IT 41648-50-4P
(prepn. of)

L9 ANSWER 24 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1973:137067 Document No. 78:137067 Poly(arylene tetrasulfides).
Hiatt, Norman A. (Uniroyal, Inc.). U.S. US 3719645 19730306, 4 pp.
(English). CODEN: USXXAM. APPLICATION: US 1971-181633 19710917.

AB Cyclic diarylene bis-tetrasulfides were polymd., for adhesive
applications, by heating in bulk or in soln. Thus, cyclic
bi(1,4-bisdithio-2,5-diethoxybenzene) (I) [23557-12-2] was
polymd. in bulk at 195.deg. for 1 hr to give 96% polymer, mol. wt.
15,800, glass transition temp. 49.deg.. I was a good adhesive when
polymd. in place between steel [12597-69-2] plates, and I polymer
was a good steel tire cord adhesive.

IT 40838-82-2P
(manuf. of, for adhesives)

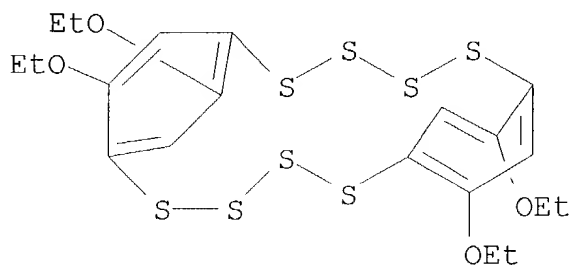
RN 40838-82-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy-, homopolymer (9CI)
(CA INDEX NAME)

CM 1

CRN 23557-12-2

CMF C20 H24 O4 S8

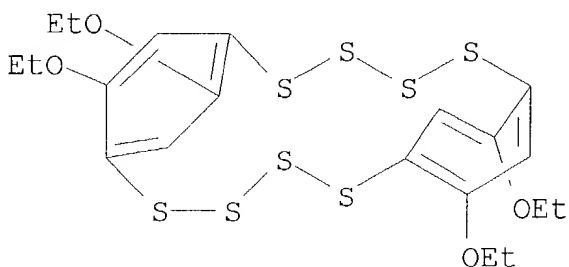


IT 23557-12-2 28321-69-9 40742-94-7

(polymn. of)

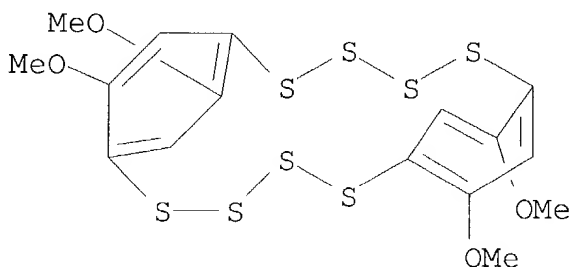
RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA
INDEX NAME)



RN 28321-69-9 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetramethoxy- (9CI) (CA INDEX
NAME)

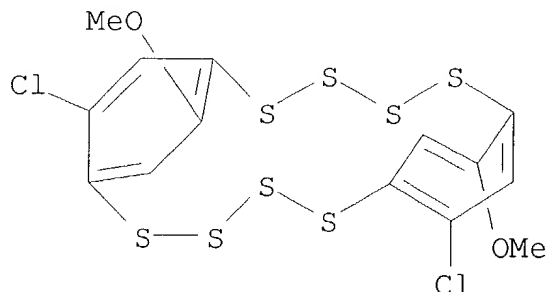


This is it

RN 40742-94-7 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15-dichloro-17,19-dimethoxy- (9CI) (CA

INDEX NAME)



IT 40838-82-2P

(manuf. of, for adhesives)

IT 23557-12-2 28321-69-9 40742-94-7

(polymn. of)

L9 ANSWER 25 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1972:501557 Document No. 77:101557 Novel macrocyclic polysulfur compounds. 7,15,17,19-Tetraalkoxy-2,3,4,5,10,11,12,13-octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaenes and 2,3,7,8-tetraalkoxythianthrenes. Products of the catalyzed reaction of aromatic ethers and sulfur monochloride. Ariyan, Z. S.; Martin, R. L. (Pharm. Chem. Res., Uniroyal, Naugatuck, CT, USA). Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999) (13), 1687-91 (English) 1972. CODEN: JCPRB4. ISSN: 0300-922X.

GI For diagram(s), see printed CA Issue.

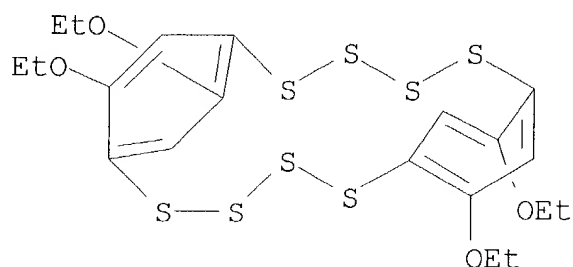
AB Reaction of .omicron.-dialkoxybenzenes (alkoxy = MeO, EtO) with S₂Cl₂ in the presence of AlCl₃ gave 2,3,7,8-tetraalkoxythianthrenes. Reaction of .rho.-dialkoxybenzenes with S₂Cl₂ in the presence of an acid-clay catalyst gave 52-60% 7,15,17,19-tetraalkoxy-2,3,4,5,10,-11,12,13 - octathiatricyclo[12.2.2.26,9]eicosa - 6,8,14,16,17,19-hexaenes (I, R = R₁ = Me or Et; R = Me, R₁ = Et). Catalytic hydrogenation of I gave 2,5-dialkoxy-1,4-benzenedithiols, while aq. chlorination gave 2,5-dialkoxybenzene-1,4-disulfonyl chlorides. Thianthrene was prepd. from PhSSCl in C₆H₆ catalyzed by AlCl₃.

IT 23557-12-2P 28321-69-9P 30079-11-9P

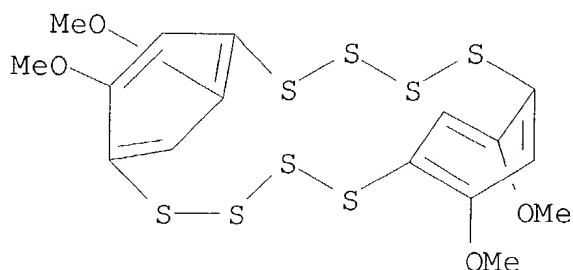
(prepn. of)

RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA INDEX NAME)

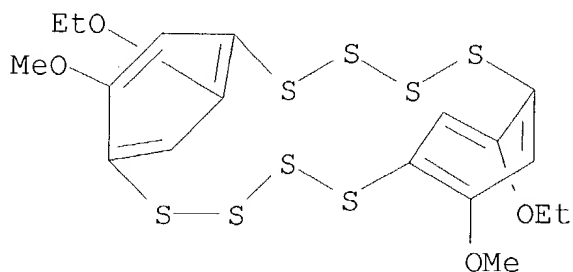


RN 28321-69-9 HCAPLUS
 CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,15,17,19-tetramethoxy- (9CI) (CA INDEX NAME)



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RN 30079-11-9 HCAPLUS
 CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,17-diethoxy-15,19-dimethoxy- (9CI) (CA INDEX NAME)



IT 23557-12-2P 28321-69-9P 30079-11-9P
 (prepn. of)

L9 ANSWER 26 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
 1972:461661 Document No. 77:61661 Synthesis, structure, and electrical properties of naphthalene, pentacene, and hexacene sulfides.

Goodings, E. P.; Mitchard, D. A.; Owen, G. (Petrochem. Polym. Lab., Imp. Chem. Ind. Ltd., Runcorn, UK). Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999) (11), 1310-14 (English) 1972. CODEN: JCPRB4. ISSN: 0300-922X.

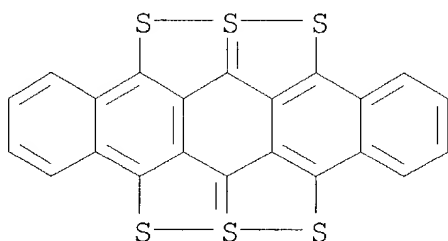
GI For diagram(s), see printed CA Issue.

AB Pentacene and hexacene on heating with S under reflux in 1,2,4-trichlorobenzene gave stable hexasulfides (I and II or III, resp.). The elec. cond. of II (or III) was similar to naphthacene tetrasulfide and 109 times greater than I. Replacement of S by Se in I gave a tetraselenide of similar cond. to I. Naphthaceno[5,6-cd] [1,2]dithiole was also isolated in 4% yield from reaction of naphthacene with S.

IT **38037-63-7P 38037-64-8P**
(prepn. of)

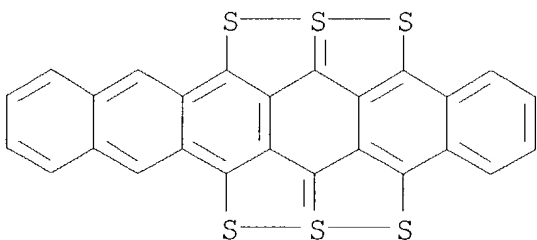
RN 38037-63-7 HCAPLUS

CN 1,6,6a.lambda.4,7,12,12a.lambda.4-Hexathiadipentaleno[2,1,6,5-fghi:2',1',6',5'-qrst]pentacene (9CI) (CA INDEX NAME)



RN 38037-64-8 HCAPLUS

CN 1,6,6a.lambda.4,7,14,14a.lambda.4-Hexathiadipentaleno[2,1,6,5-fghi:2',1',6',5'-uvw]hexacene (9CI) (CA INDEX NAME)



IT **38037-63-7P 38037-64-8P**
(prepn. of)

L9 ANSWER 27 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1971:544848 Document No. 75:144848 Crystal structure of

7,15,17,19-tetraethoxy-2,3,4,5,10,11,12,13-octathiatricyclo[12.2.2.26,9] eicosa-6,8,14,16,17,19-hexaene, a sulfur analog of the paracyclophanes. Ricci, John S., Jr.; Bernal, Ivan (Dep. Chem., Brookhaven Natl. Lab., Upton, NY, USA). Journal of the Chemical Society [Section] B: Physical Organic (10), 1925-32 (English) 1971. CODEN: JCSPAC. ISSN: 0045-6470.

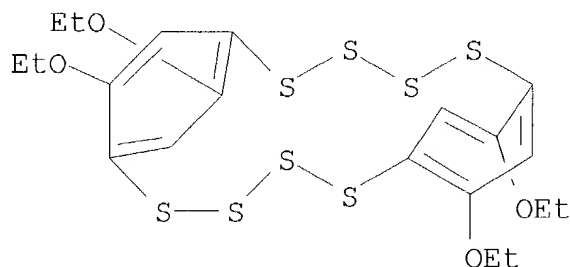
AB The crystal and mol. structure of the title compd. were detd. from 3-dimensional diffractometer data. The crystals have space group P21/c with a 10.198, b 9.454, c 29.845 .ANG., .beta. 115.17.degree., Z = 4, and d.(detd.) 1.48 g/cm³. The final R was 0.043 for 2590 unique reflections. The Ph groups are planar and nearly parallel to one another, and the bond lengths and angles in the (EtO)2C6H2 fragments are normal. Because of their ortho positioning in the Ph rings, there are relatively short O-S contacts which are made more pronounced by a bending of the O and S atoms towards each other. The S-C bond lengths indicated double-bond character, and there is bond-length alternation in both S4 chains, which suggests conjugation between pH rings across these chains.

IT 23557-12-2

(crystal structure of)

RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA INDEX NAME)



IT 23557-12-2

(crystal structure of)

L9 ANSWER 28 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1971:498551 Document No. 75:98551 Chemistry of sulfur. 106.

Synthesis of bis(chlorodisulfanyl)benzenes and hexathia[3.3]cyclophanes. Feher, Franz; Glinka, Klaus; Malcharek, Franz (Inst. Anorg. Chem., Univ. Koeln, Cologne, Fed. Rep. Ger.). Angewandte Chemie, International Edition in English, 10(6), 413-14 (English) 1971. CODEN: ACIEAY. ISSN: 0570-0833.

GI For diagram(s), see printed CA Issue.

AB Hexathia[3.3]cyclophanes are prepd. by the reaction of x-HSC6H4SH

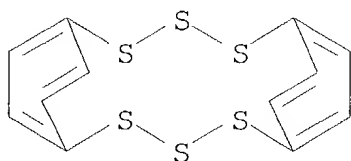
with x-ClSSC6H4SSCl (I); I are prepd. from the corresponding benzenedithiols. Thus, o-benzenedithiol (II) is treated with SCl₂ in CCl₄ to give o-bis(chlorodisulfanyl)benzene which is treated with II in CCl₄ to give hexathia[3.3]orthocyclophane (III). Similarly prepd. are hexathia[3.3]metacyclophane (IV) and hexathia[3.3]paracyclophane (V). Benzenedisulfonyl chlorides are treated with Zn in HCl to give benzenedithiols.

IT 33372-88-2P

(prepn. of)

RN 33372-88-2 HCAPLUS

CN 2,3,4,9,10,11-Hexathiatricyclo[10.2.2.25,8]octadeca-5,7,12,14,15,17-hexaene (8CI) (CA INDEX NAME)



IT 33372-88-2P

(prepn. of)

L9 ANSWER 29 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN

1971:12824 Document No. 74:12824 Tricyclic polysulfur compounds. Ariyan, Zaven S.; Martin, Robert Leduc (Uniroyal, Inc.). Ger. Offen. DE 2010787 19701001, 51 pp. (German). CODEN: GWXXBX. PRIORITY: US 19690306.

GI For diagram(s), see printed CA Issue.

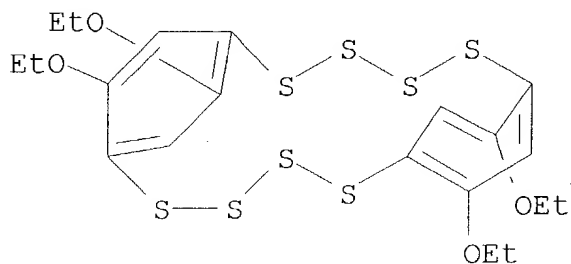
AB Tricyclic aromatic bistetrasulfides (I) (R = OMe, OEt, or OCH₂Ph; R₁ = OMe, OEt, OCH₂Ph, or Cl), with exceptional accelerator activity for the vulcanization of rubber, e.g. styrene-butadiene rubber, were prepd. by treating p-substituted alkoxybenzenes with S₂Cl₂ in an inert solvent in the presence of a catalyst. Thus, 1,4-dimethoxybenzene was treated with S₂Cl₂ in CH₂Cl₂ in the presence of Girdler catalyst KSF/O. The product was worked up to give I (R = R₁ = OMe). The I were also useful intermediates for prepg. II (R and R₁ as in I; R₂ = SH, SCl, SO₂Cl, or alkyl-, acyl-, or arylthio groups) with herbicidal and fungicidal properties.

IT 23557-12-2P

(prepn. of)

RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA INDEX NAME)



IT 23557-12-2P
(prepn. of)

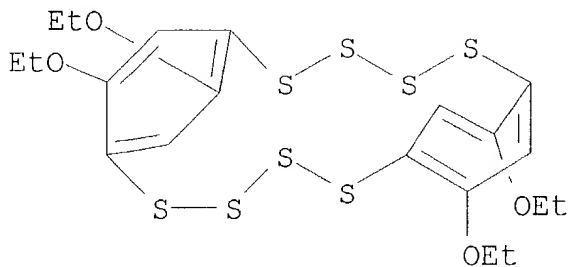
L9 ANSWER 30 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1970:71881 Document No. 72:71881 Crystal structure of
7,15,17,19-tetraethoxy-2,3,4,5,10,11,12,13-
octathiatricyclo[12.2.2.26,9]eicosa-6,8,14,16,17,19-hexaene, a
sulfur analog of the paracyclophanes. Ricci, John S.; Bernal, Ivan
(Dep. of Chem., Brookhaven Nat. Lab., Upton, NY, USA). Journal of
the Chemical Society [Section] D: Chemical Communications (24),
1453-4 (English) 1969. CODEN: CCJDAO. ISSN: 0577-6171.

AB Yellow crystals of the title compd. have the lattice parameters a
10.198, b 9.454, c 29.845 .ANG., and .beta. 115.17.degree.; d.
(exptl) = 1.48, d. (calcd.) = 1.49, Z = 4, and the space group is
P21/c. The benzene rings are planar with normal bond lengths and
angles. The S and O substituents of the rings are close, av.
distance 2.78 Å. The av. C-S bond lengths 1.78 .ANG., imply
.apprx.15% double-bond character, while the C-O bonds are typical
of O-aromatic C distances. The bond lengths and valency angles of
the S in the tetrasulfide chains are very similar to those found in
orthorhombic S.

IT 23557-12-2
(crystal structure of)

RN 23557-12-2 HCAPLUS

CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA
INDEX NAME)



IT 23557-12-2
(crystal structure of)

L9 ANSWER 31 OF 31 HCAPLUS COPYRIGHT 2004 ACS on STN
1969:480850 Document No. 71:80850 7,15,17,19-Tetra-alkoxy-
2,3,4,5,10,11,12,13-octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene. Ariyan, Zaven S.; Martin, Robert LeDuc
(Agr. Chem. Res., Uniroyal, Naugatuck, CT, USA). Journal of the
Chemical Society [Section] D: Chemical Communications, 15, 847
(English) 1969. CODEN: CCJDAO. ISSN: 0577-6171.

GI For diagram(s), see printed CA Issue.

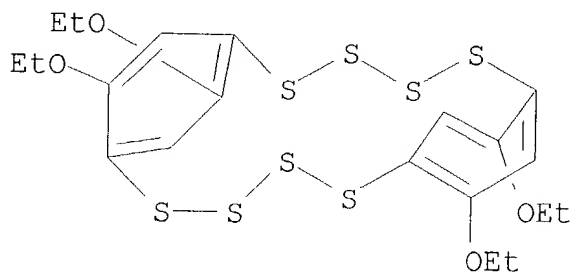
AB Under catalytic conditions, treatment of o-dimethoxy- and
-diethoxybenzene with S₂Cl₂ gave 2,3,7,8-tetramethoxythianthrene, m.
175-6.degree., and 2,3,7,8-tetraethoxythianthrene, m.
129-30.degree.. In the case of p-diethoxybenzene under similar
catalytic conditions, a large ring cryst. polysulfide was obtained
which was assigned the structure I. Single orange crystals of I
were monoclinic with space group P2₁/c, Z = 4, a 10.15, b 9.23, c
29.6 A., .beta. = 115.degree., 39', D₀ 1.49 g./cc. Redn. of I gave
II, m. 119.degree..

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CN 2,3,4,5,10,11,12,13-Octathiatricyclo[12.2.2.26,9]eicosa-
6,8,14,16,17,19-hexaene, 7,15,17,19-tetraethoxy- (8CI, 9CI) (CA
INDEX NAME)



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